

~~3. 12~~ 12 ^{42 2}
7396 F 9 71

~~11~~ Under the head of the sensible qualities of
~~the~~ the Air I have mentioned its rarity and
density; on each of which I shall deliver
a few remarks. — V

Air highly rarefied such as exists upon
very high mountains produces ~~many~~ ^{a palpitation}
very distressing effects. These are ~~a quickness~~
of the heart — sickness at the stomach, loo-
sening of food — great thirst profuse sweats,
sleeplessness, great pain from the action of the sun's rays
— an overflow from spirituous liquors ~~on~~
upon the skin —
a quick ~~weak~~ pulse, with great muscular
weakness. Mr. Saupure, who describes these
symptoms ~~says~~ as occurring on Mount
Blanc in Switzerland says he could not
advance more than 15, or 16 steps without
stopping to take breath. After resting a

V In Baron Humbolt who ascended to the summit of the Jumbamarca a mountain in South America 20,000 ^{feet} ~~miles~~ above the level of the Ocean, and of course the highest mountain in the world, ^{informed me that the} ~~he informed me~~ he produced haemorrhages from his mouth, nose & lips, a redness in his eyes, sickness at his stomach and a pain in his breast which continued for several days afterwards. His sense of cold he says was very great, altho' the mercury fluctuated between 40° & 50° of Fahrenheit. [The oxygen ^{in the air} was reduced by his eudiometer to 19 parts in the 100].

The snow upon this mountain was so soft and yielding ^{from the light pressure of the air on it} that a stone fell thro' it as if it had been thrown into water, ~~from the light pressure of the air upon it~~ But

few minutes those symptoms went off,
 but they returned with the least exertion.
 Even the mules which accompanied him
 were affected with immobility of their
 limbs, ~~and difficulty of breathing - panting~~
~~and an eruption of plaintive~~
~~moans~~ and an eruption of plaintive
 groans. The mercury at this time stood
 at 12 inches. These symptoms of disease
 and distress have been attributed to a defi-
 -ciency of oxygen in the upper regions
 of the air, and a ~~rapid~~ rapid consumption
 of the combustible matter in the lungs
 blood, such as constituted the impure
 air discharged by respiration, that they are
 more probably occasioned by the ^{sudden} disproportion between
 the density of the external & internal air.

= a more extraordinary instance of the effects
of the rarity of the air upon the human body oc-
-curred at Padua on the 22nd of August 1808.
Two gentlemen viz ^{Mr} Andreoli and ^{Mr} Bri-
-occhi ascended in a balloon together. ~~down back.~~

On the 22d of August, last year, M. An-
d्रेoли, and M. Briocchi, ascended in a balloon
at Padua. When the mercury had fallen to
15 inches, about the height of $3\frac{1}{2}$ miles the
latter began to feel an extraordinary palpitati-
on of the heart, without any painful sensation
in breathing. When the mercury was down
to 12, ($4\frac{1}{2}$ miles) he was overpowered with a
pleasing sleep, that soon became a real lethar-
gy. The balloon continued ascending, & when
the mercury was about nine inches, (near six
miles) M. Andreoli perceived himself swollen
all over, and could not move his left hand.—
When the mercury had fallen to 8,5 [about
six miles and a quarter,] the balloon burst with
a loud explosion, and began to descend rapid-
ly with much noise, which awoke M. Brioc-
chi. It fell about 12 miles from Padua, with-
out any injury to the aerial travellers.

1808

London Mag.

^{Up Discrepancy}
The difference between the
effects of the air upon Baron
^{then} Humboldt & the adventurers
in the Balloon probably
arose from the more
gradual manner in w^{ch}
the Baron was exposed to
it. ~~The same was the case~~

Symptoms of disease and distress that have
been mentioned, have been ascribed to a deficiency
of oxygen in the upper regions of the air, but
I shall presently mention another cause
which probably cooperates with it. ~~Bar~~ ^{apicrasmus}

A woman died suddenly in the stage on the
Summit of the Allegany from an Hemoptysis.
She had been affected with a few weak cough.

482
Air expands in its density that is about 28 inches,
~~blood difficult from the~~

by compressing the lungs, renders the return
of the blood difficult from the brain, and thus
produces cephalic congestions. In the years
1768 & 1770 The mercury in the Barometer stood
at an unusual height in the part of

The Pneumonia which occurs in a putative
rally dense Air it has been observed by Dr.
Laurette resolve themselves ^{always} by stools & sweats, and
not by expectoration owing to the pressure
of the Air ^{upon} the lungs. Asthma and

Consumptive people suffer greatly from it,
and the same Author says Dropsical patients
exhibit an increase or decrease of swellings
according as the mercury rises or falls in the
Barometer.

The influence of the different degrees of
rarity & density of the Air, ^{upon the body} may easily be conceived
of by recollecting their effects on fluids in and
out of an exhausted receiver.

75
✓ The rarity & Density of the Air like heat & cold act re-
latively upon the body. ~~As the~~ ~~suddenness~~ of the changes in the
Temperature of the Air ~~is~~ affects health
& life more than its extremes of heat & cold,
so the suddenness in the changes in the Density
& rarity of the Air, produce the worse effects on
the body than the ordinary extremes of each
of them. Boulaillon a french writer ascribes
a number of sudden deaths which occurred at
Pluvios in Decr 1747 to a sudden diminution
of the weight of the Air. The Mercury fell in
two hours in two inches, & 8 lines in the
Barometer. It has been remarked that old
fouls, & Rheumatic pains are often made
worse by a sudden diminution of the weight
of the Atmosphere. = Birds in Africa

~~When the density of the Air is gradually~~
~~increased, the body stands are impeded by it,~~
~~but when it falls down & are unable to rise~~
~~when the Air suddenly passes from rarity to~~
~~density.~~
Density = 82 - separate paper
all ^{substances} differently as separate or combined.

It has been observed that the $\frac{1}{2}$ in varies in its heights at different periods in the four & twenty hours. It begins to rise in the beginning of the night - & continues to rise till midnight, after which it descends ~~part~~ till the approach of day - then it ascends gradually till midday, when it again descends till evening, making a ~~small~~ ^{a little while} ~~at~~ each time before its ascent, & descent. The times of its rest are so regular that B. Hombolt informed me they had served him at one ^{time} instead of a Clock or Watch. The greatest changes in the thermometer generally take place at the four ~~same~~ ^{same} times of these changes in the Barometer. These facts are important as they tend to throw some light upon the changes which take place in diseases, and perhaps of some of the variations of the state of the system in health. May not the pulse be influenced ^{by them} in its frequency & force in the different times of the night ~~& day~~? ✓

= Birds in some parts of Africa travellers tell us, fall suddenly from the air, and are unable to rise from the ground when the air passes suddenly from a rare to a dense state.

The rarity & density of the air, and the suddenness of with which it passes into either of them affect the human body more or less according to ^{the quantity} ~~their~~ ~~presence~~ ~~of~~ ~~heat~~, cold, moisture or dryness ^{or less presence of} ~~bein~~ ~~in~~ ~~the~~ ~~atmosphere~~ ~~with~~ ~~heat~~, cold, moisture or dryness ^{being in in 1809 after windfall}.

Dryness in the atmosphere. We have thus considered the effects of ~~air~~ ~~acting~~ ~~externally~~ ~~upon~~ ~~the~~ ~~body~~, but a

~~under this head, I shall introduce an~~ ~~of~~ ~~a~~ ~~new~~ ~~work~~ ~~which~~ ~~has~~ ~~late~~ ~~ly~~ ~~been~~ ~~published~~ ~~in~~ ~~France~~ ~~by~~ ~~a~~ ~~D^r~~ ~~Vidal~~ ~~upon~~ ~~what~~ ~~he~~ ~~calls~~ ~~"Gas~~ ~~Animal"~~, or in other words upon the influence of air in its elastic state within the body. I shall premise my ~~act~~ ~~of~~ ~~this~~ ~~work~~ ~~by~~ ~~improving~~ ~~that~~ ~~when~~ ~~expiring~~ ~~in~~ ~~quality~~ ~~or~~ ~~out~~ ~~of~~ ~~place~~, there is a great difference between the effects

76.
of air injected into the blood vessels, & into
parts not accustomed to contain it in a healthy
animal, and the evolution of air from the
solids ^{or fluids} of the body in a diseased
state ^{after} with its excitability, ^{is} nearly or totally
expended by irritants, or ^{by} matters not belonging
to the natural stimuli of life. Recall here
the difference in the effects of irritants applied
^{suddenly} ~~insensibly~~ & slowly in the production of pain, to
~~account for this~~ this remark being premised
you will be prepared to hear ~~that~~ the follow-
ing facts collected by Dr Vidal. 1 He mentions many
instances of ~~emphysematous~~ swellings from
the neck and about the head in pueris and
apoplexies. 2 He mentions an instance
of a man from ~~D'Hann~~ ^{from D'Hann} who ~~discharged~~ ^{was afflicted}
~~air from his chest~~ with palpitation of the
heart, cough and vertigo who emitted air
from his chest when ever his body was severely
pressed. Several cases similar to this are
quoted from Morgagni, Bartholines, and

762

Rhadius. - 3 He mentions from a D'Neil
the case of a ^{very much} young man who ~~committed~~
after indulging himself to great excess in
venery, discharged ^{air} only thro' his Urethra
in his Venereal intercourse with his wife.
p. 86.

4 He mentions from D'Hales exp^t 19. Art. IV
an experiment which proves that Air
passes freely from the blood into the stomach
& bowels.

5 He mentions the appearances of the
blood when drawn from a Vein, and of matter
discharged from the Stomach in puking, in
both of which there are appearances of ^{air} ~~elastic~~
in its elastic state.

6 He gives a long list of authors who have
discovered Air to be present in ~~various~~ the different
Constitutes of the body After Death from a great
number of diseases. Portal found it in the brain.
Upon the subject of this new and

7A3

Franklin

interesting work. I shall make ^{further} two remarks.

1 I have no doubt of the diminution of
Air from the blood into the stomach &
bowels in several diseases, particularly in
bilious fevers. This idea occurred to me with
great force in the fever of 1793 in which a
Belching of wind was a constant & distressing
symptom during each paroxysm of the fever,
and in cases where the stomach and bowels
contained neither Aliment nor Drinks. This
discharge of wind ceased with the cessation
of the paroxysm of fever. The fluids in this
~~paroxysm~~ state of the system ^{blood & other} ~~are~~ ^{flow} ~~are~~ ^{are} wholly
in a centrifugal direction. They are probably
~~partly decomposed~~ ^{partly decomposed} from the violent action of the blood vessels
upon them ~~partly decomposed~~ in consequence
of which they evolve their Air in an elastic
state.

Note.
2 I have mentioned in the history of
the pulse a gaseous pulse which occurs

in malignant fevers more especially ^{blood letting.} towards
 their close and after copious depletion. It
 is soft, ^{but} and yields to the lightest pressure.
 — May not this pulse be kept up by the
 stimulus of air in a rarefied state in the
 blood vessels? Dr. Hook says he excited
 the action of the ^{heart after death} by injecting air into
 the blood vessels; and Dr. Haller asserts that
 air stimulates the heart more powerfully
 than blood itself. — In addition to these facts
 I shall add ^{two} more, viz the escape of air from the
 vein of a man ^{bleed last summer in the hospital 1811} who
 informed me that he had frequently upon
 opening a vein heard a noise that resembled
 the sudden issuing of air from a place in
 which it ~~was~~ had been confined. —

If the presence of air in an elastic
 state ^{phenomena induced in the body} be admitted in the body it will account
 for the sudden deaths induced by the ^{Italiane philosophers} sudden diminution
 of the ^{weight} of the air at Phlebotomy.
 — The deaths were induced by the too
 sudden expansion of the air in the body stimulating it
 by over-distension to its disengagement.

~~28~~

13

87

77

~~page~~

On the effects of Windsor

1

~~12~~

Health &c

1 \$

1 \$

he

Endic

14

~~For~~ Having considered the effects of heat & cold ^{and of the rarity & density of the air} in this positive & relative effects operation on the human body, I proceed to mention the effects of the winds in producing diseases.

They are hot & cold, wet and dry according to the situation of countries. & in ^{the United} ~~the~~ States they are hot from the South because they come from the heated soil, ^{or of the American} cold from the north, because they come from Canada, & still higher latitudes. Dry from the West because they come from high & dry latitudes, & wet from the East because they pass along ^{the Atlantic} the ocean. In Britain the West wind is moist from the same cause as our East wind is wet, - viz it coming across the Atlantic Ocean.

In addition to this operation as hot cold - wet & dry - the winds act upon the body according to the following relative circumstances.

- 1 Heat is lessened, & cold increased by them. ^{cold} Heat is increased by moist winds, &

Dr Albert mentions a curious
[5] ~~fact of a high wind producing an epidemic~~
~~bilious fever. Upon enquiry it was found~~
~~it had passed over a Lake and by drying~~
~~it from its immense force, exposed its bottom~~
~~to the rays of the sun, & thus favoured the~~
~~production of those exhalations which I~~
~~shall presently say are the causes of those~~
~~fevers. Take notice of this fact - for it is~~
~~contrary of the usual effects of high winds~~
~~on bilious fevers. They are generally checked~~
~~by them.~~

79

Exposed by such as are dry.

2 Winds are to the body, compared with Air, what ~~the cold bath is to washing it with water~~ is, to bare immersions in a cold bath: ~~they produce~~ ^{they produce} ~~indignity, stimulating effects;~~ - hence when the body is long exposed to them, they debilitate

by the expenditure of excitability. who has not felt fatigue in walking, or travelling against the wind?

3 The transitions of the weather from heat to cold & vice versa more certainly affect the body with debility and disease when they are accompanied with ~~to~~ a high or strong wind. but ~~catarrh~~ most common when this is the case. But

4 Winds affect the body with debility & disease ^{study} when they suddenly change from a course, that is even where they are not attended w. the least change in the thermometer. This

is always the case Dr. Ross says in Jamaica when the wind which generally blows from the East, suddenly blows from the South, or West. ~~the~~

5 ~~the~~ The Winds produce certain changes ~~are said to dispose to colic~~

80 faculties & operations of the mind.
in the tropics. At Messina the Sirocco wind
which is hot & dry dulls the ~~too~~ understanding.
This fact is so notorious that it is common
in that country & in some parts of Italy to
call a dull or stupid look, "a Sirocco performance".
- The South wind at Rome obtained the epithet
of "Plumbus Aruster" probably from its effect
- ting the intellects with heaviness or an inability
to act with their customary alidity. The
Air from the Sea at Moutpucier is said to
produce the same effect. In north^{ch} County
in England ~~at the sea~~ the wind from the sea w:
generally conveys a moisture or a mist with it
produces greenness of lawns known by the
name of Sea fret. The same thing occurs in
Barcelona in Spain, & from the same cause.
The north east wind has an unfriendly effect
upon the feelings of the inhabitants of the
middle states of America.
6 The winds act more uniformly upon
invalids than upon healthy people. The

✓ The Changes in the weather induced by the
Vernal & autumnal equinoxes are unfavorable to
health. Dr. Cline observed an increase of febrile patients
in the Liverpool Infirmary at these periods, and Dr. Darwin
says occurs most frequently at these periods.

✓ The Hurricanes in the West Indies ^{are} some-
times ^{injurious} ~~being~~ ^{by} ~~the~~ ^{elevating}
the sea so as to overflow the land where
by mixing with vegetable matters ^{it} ~~then~~
produces putrefaction & exhalations &
fevers, ~~and~~

81
East winds is ⁸¹ most hostile to such people
than any other. They affect ~~prolonged~~ ^{asthmatic}
~~and~~ ^{and} ~~consuming~~ ^{consumptive}, & Rheumatic patients
most. I know a Sea Captain who is subject to
Asthma who can tell in his bed at midnight
when the winds changes to the Eastern points
of the Compass.

7 Winds from any quarter attended with so
much force as to constitute a stormy wea-
-ther, ^{not only} produce great changes in diseases, but
they affect persons of a certain description,
in health. They ^{are said} ~~appear~~ to ~~excite~~ bring on
parturition - & hence the complaint of wind:

- wives of being called out Offensively stormy wea-
-ther. Perhaps the labor is induced only by the fear
- this is probably well founded. An Old Nurse
informed me she had often observed children
to be more affected with the Belly ache in
stormy weather, than in any other kind of
weather. ✓

✓ The late Discoveries of the heptagonal
Nature of the Air. prepare us to believe
it to ^{be} capable of Decomposition and of
course of a new & morbid Arrangement
of its constituent parts. It is possible the
sickening quality acquired by a stagnating
Atmosphere, may be confined only to
those Airs which are ~~occasionally or frequently~~
agitated by the Winds. I am led to make
this remark, by a fact communicated to
me by Baron Humboldt, he said that
in an extensive Country inhabited by several
tribes of Indians on the head waters of the
Orinoco & Black Rivers in North America,
no leaf had ever been seen to be moved by
a breath of Air. The Indians have not in
their language a word to express Wind, &
yet they are not more fishy than persons under
equal circumstances (the Absence of Wind excepted)

not only Winds, but the Absence of all
 Wind produces Disease. Hippocrates long ago
 mentioned the Season "sine Aura" as a
 sickly one. The Calm at Sea when
 of long continuance, generally produces Sick-
 -ness. This was remarked in the first ships
 that sailed embarked in the East India Trade
 from England, particularly on board a
 vessel commanded by a Capt. Lancaster
 in the year 1603. It has since been
 taken notice of
~~repeatedly~~ by Dr Clark in his treatise
 upon the diseases of East India Voyages.

I shall ^{pass over} ~~there~~ the diseases produced
 by the Winds when they are impregnated
 with miasmata, ~~They will~~ and other
 adventitious matters. They will come in
 more properly hereafter. Introduce
 here in 1808 relative effects of Season &
 winds in the year No 2

in other parts of South America
go to P. B.